

10/620,190

BRI/024

REMARKS

1. Restriction

The undersigned understands that species are not claims and vice versa, but was simply pointing out in the previous reply that restriction as to the cited species was improper because there were no pending claims mutually exclusively directed to either of the species. See MPEP 808.01(a) and 806.04(f).

2. Anticipation

Claims 1-8 and 11 stand rejected as anticipated by U.S. Patent No. 4,674,047 to Tyler et al. ("Tyler"). Claim 1 (on which claims 2-12 depend) is amended to add the following new limitation:

said master device perform[s] the followings steps:

- (i) first issuing on said bus a charge command that is received by all said slave devices connected to said bus ... but which is by itself insufficient to cause any of said slave devices to begin charging; and,
- (ii) then issuing on said bus a clock sequence in which specific clock values cause corresponding specific slave devices to begin charging

In contrast, Tyler requires that a power up command be given separately,¹ sequentially to each detonator (e.g., col. 20, lines 17-31), which is a time-consuming and complicated process (see, e.g., col. 10, lines 43-52 and col. 16, lines 23-27, describing decoding and matching of 16 character security codes) compared to the simple clock sequence of the present invention as recited in

¹ As noted at col. 7, lines 12-18 of Tyler, the power up command could alternately be a general command that is not addressed individually. In that case, however, staggered charging would never occur because charging of every slave device would commence simultaneously.

10/620,190

BRI/024

claim 1. The claimed use of a sequence of mere clock values to trigger charging of slave devices at different times is neither taught nor suggested by Tyler, and unlike Tyler it provides an easily controllable means of staggering charging that can be readily tailored to the specifics of a range of networks.

Amended claims 2 and 3 are directed to the method of charging just discussed further comprising the charging of one or more banks of slave devices. Within a bank, all slave devices begin charging simultaneously in response to the issuance of the clock value corresponding to the bank; multiple banks begin charging at different times from each other. The system disclosed by Tyler is not capable of charging slave devices in banks, because in Tyler commands are addressed sequentially and individually to each detonator based on its unique identification number.² It is also noted that the unique identification numbers taught by Tyler could not usefully be modified to be non-unique without defeating the paramount function of providing differential time delays among the detonators. The claimed method of charging detonator banks provides a significant benefit in handling staggered charging of large slave device arrays, which benefit is not permitted by Tyler.

Next, claim 6 contains the limitation that "said clock sequence includes a clock value corresponding to the scratch value of each of said slave devices." However "scratch value" is defined, Tyler does not disclose any clock values corresponding to the scratch value of any slave device.

² Again, as noted in footnote 1, Tyler's disclosure of the alternate possibility of a general power up command that is addressed to all detonators simultaneously (e.g., col. 7, lines 12-18) is irrelevant since that option is completely incompatible with staggered charging as set forth in claim 1, from which claims 2 and 3 depend.

10/620,190

BRI/024

As to claim 7, again Tyler does not disclose the use of banks.³

As to claims 8 and 11, the significance of the cited passages of Tyler to the aspect of staggered charging as a function of the clock sequence's temporal frequency is not understood. Tyler does not disclose the use of any clock sequence in charging as claimed.

3. Obviousness

Claims 9, 10, and 12⁴ stand rejected as obvious over Tyler in view of U.S. Patent No. 3,752,081 to McKeown et al. ("McKeown"). Each of claims 9, 10, and 12 includes the limitation of a "constant-current, rail-voltage limited charging process," which the Office Action alleges is disclosed by McKeown and would have been obvious to incorporate into the subject matter of claim 1 allegedly disclosed by Tyler. It is respectfully submitted that McKeown discloses a constant current source, but does not contain any disclosure - express or inherent - that such source is used in constant-current charging. To the contrary, it appears impossible that the disclosed circuitry could result in such charging. Moreover, the constant current source disclosed in McKeown is for use in the master device (the blasting machine), not for charging the slave devices as claimed in claims 9, 10, and 12. The two different applications would necessitate substantial, material, structural differences.

³ Whether the detonators of Tyler are charged all at once (e.g., col. 7, lines 12-18) or sequentially one-by-one, the system of Tyler could not charge detonators in banks with staggered charging.

⁴ The Office Action technically states that all of claims 1-12 are obvious over this prior art combination, however, the rejection only provides support for the finding of obviousness of the substance of claims 9, 10, and 12. The inclusion of all claims in the obviousness section thus was evidently a typographical error.

10/620,190

BRI/024

Conclusion

For the foregoing reasons, favorable action on this application is respectfully requested. It is believed that no fees are due with the present response, but if any fee is required, it is hereby requested that such fees be charged to the undersigned's Deposit Account No. 502502.

Respectfully submitted,

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